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(71) Applicant(s)

Comrise Electronics Co., Ltd

(Incorporated in Taiwan)

No.55-1 Lane 344, Chung Cheng South Road,
Yeong Kang Hsiang, Tainan Hsien, Taiwan

(72) Inventor(s)

Yuan Neng Fan

(74) Agent and/or Address for Service

Kilburn & Stroe

30 John Street, LONDON, WC1N 2DD,
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(56) Documents Cited

GB 2251764 A EP 0408041 A2 US 4924496 A

US 4894861 A

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(54) Calling party identifying apparatus

(57) A calling party identifying apparatus electrically connected to an exchange system which can provide the calling number and the registered name of the phone set (12) or the like (such as a fax machine) includes a receiver (21), a microprocessor (24), a memory (29), an LCD (25), a key pad (28), a plurality of lights, and a speaker. The memory has a database installed therein including a plurality of potential callers' information each of which includes a specific caller's name, the calling number of the caller, the preference degree thereof, and the preferred hours for the caller to call. The identification apparatus is allowed to display the caller's name on the LCD instead of displaying the registered name of the calling device. When any call comes in, the identification apparatus will check from the database and display the caller's name, the calling number thereof, and the preference degree thereof.

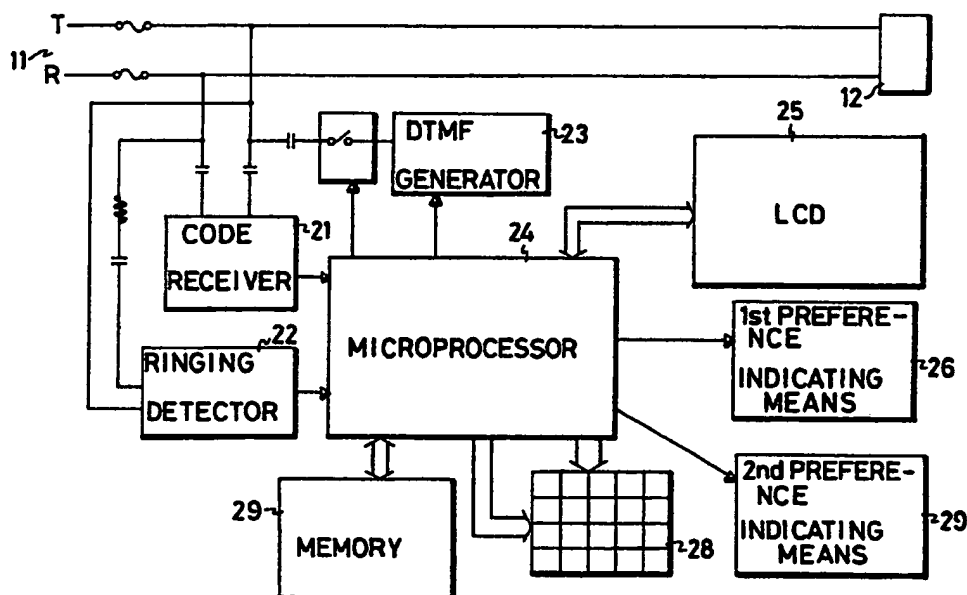


FIG 1

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

This print takes account of replacement documents submitted after the date of filing to enable the application to comply with the formal requirements of the Patents Rules 1990.

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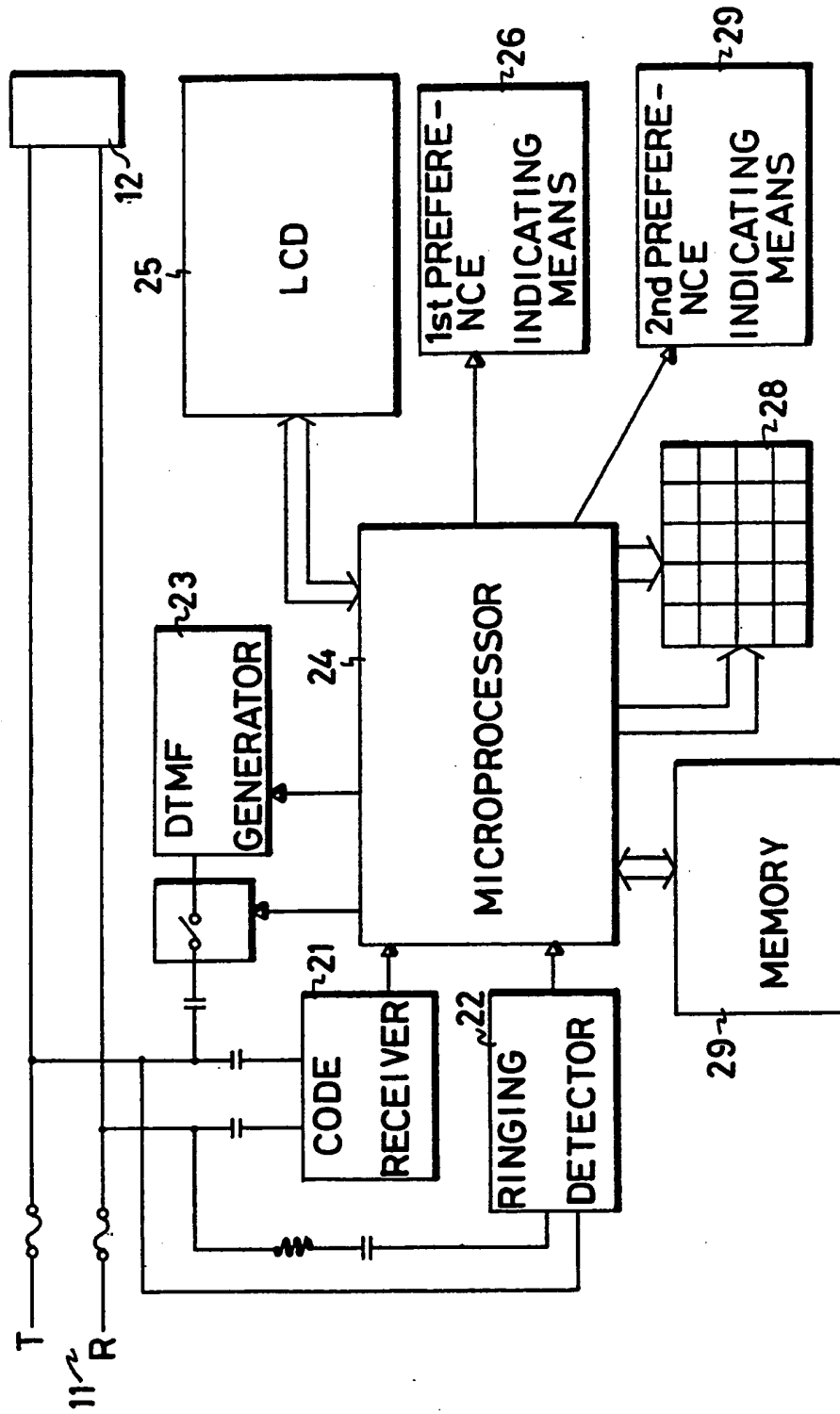


FIG 1

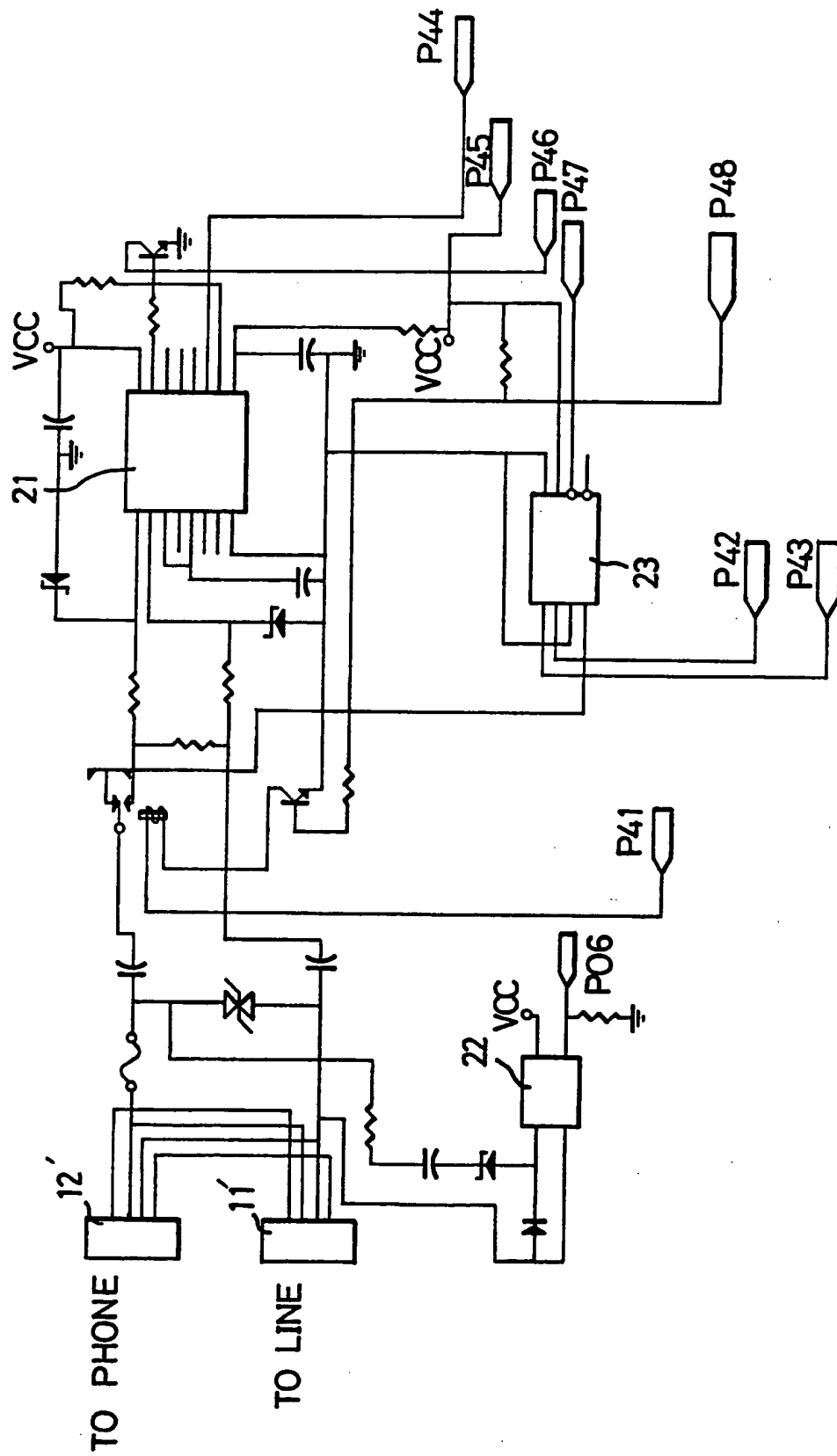


FIG. 2A

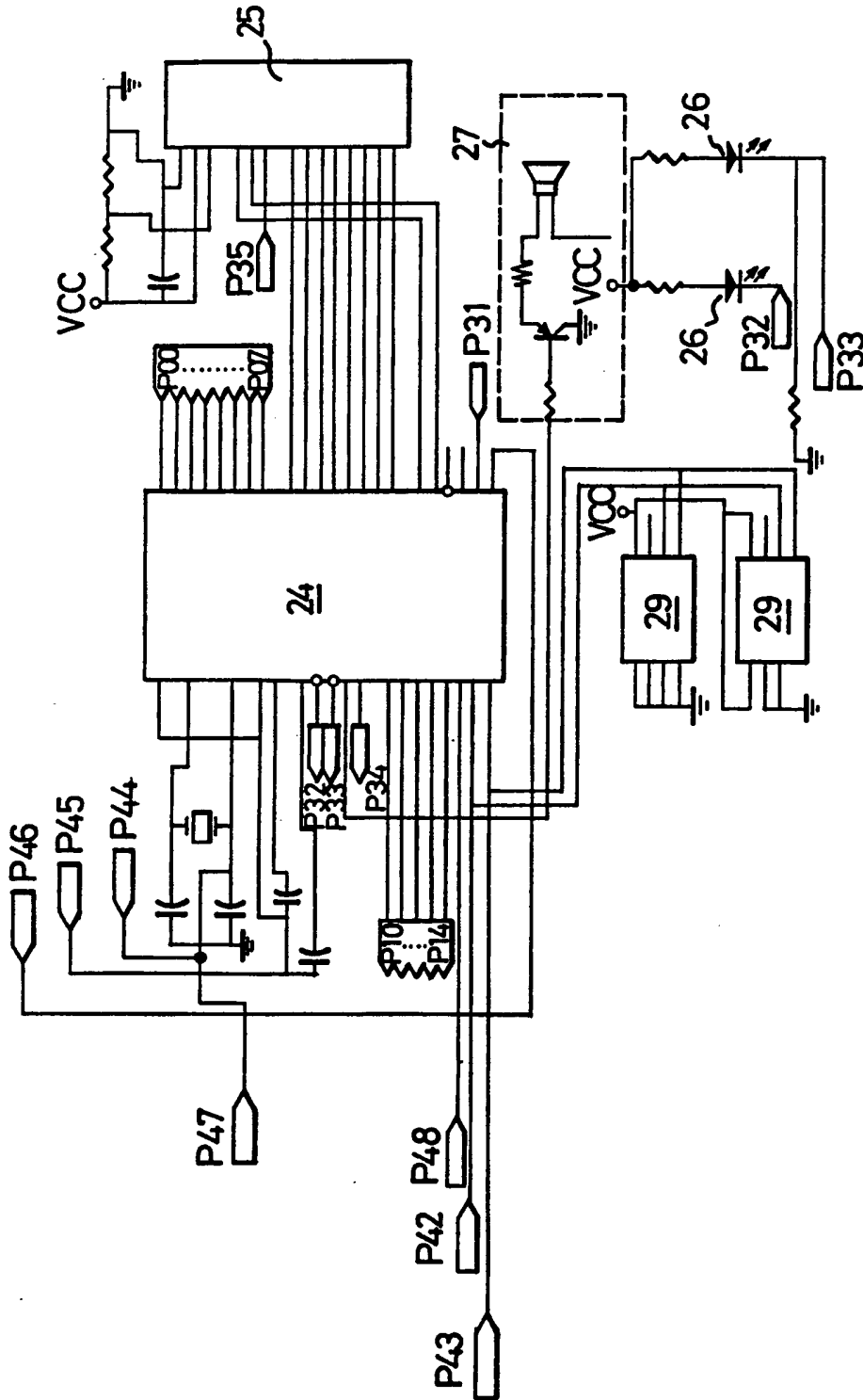


FIG. 2B

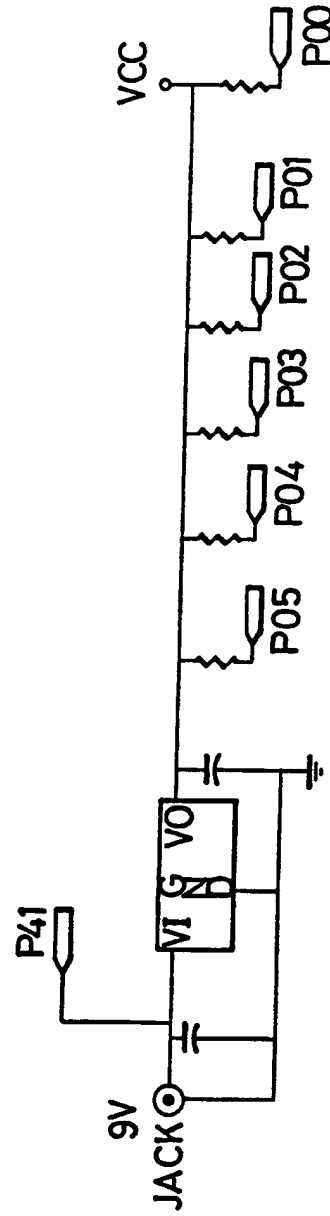
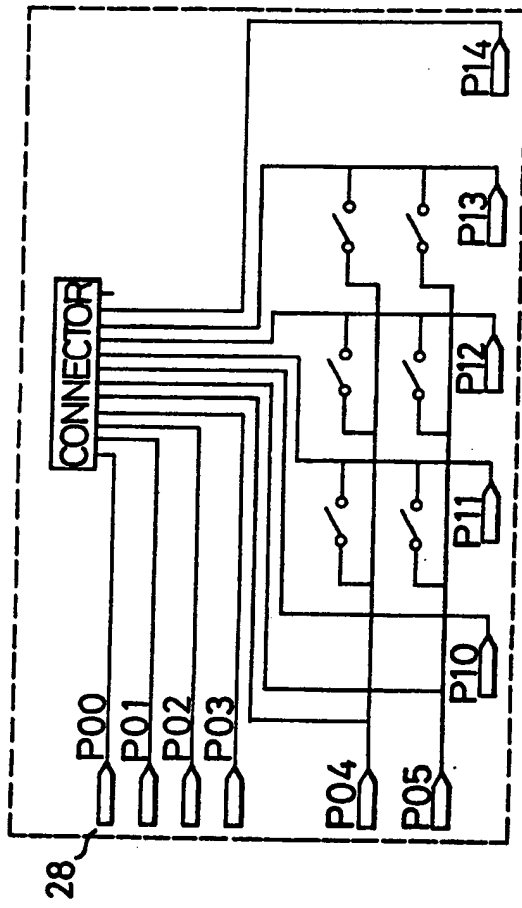


FIG. 2C

CALLING PARTY IDENTIFYING APPARATUS

This invention relates to a calling party identifying apparatus (Caller ID), especially for one which identifies the calling party and displays the related information including the caller's name (not necessarily the registered name for the number), the telephone number of the caller, and the preference degree of the caller, thus screening the call before the user receives the call. Moreover, the calling party identifying apparatus can cut off any call ringing if the latter is not coming in during preferred hours for the corresponding caller to call. The preferred hours for different callers have been already preset in a memory of the calling party identifying apparatus. The calling party identification apparatus is allowed to be installed on any telephone set or any telecommunication device linked to a telephone line for screening the incoming information therefrom and preventing any unwelcome or strange information to come in. The calling party identification apparatus also allows a user to make a call merely by dialing one or more characters instead of dialing the whole number.

In the conventional telephone service, a called party is informed of calling party by a sequence of ringing sounds from a telephone. The called party has to pick up the phone and listen to the calling party to identify the calling party. However, the called party

might not want to talk with the calling party if he knows first "who" is calling. It is known that some exchange systems of the telephone company can send identification information including the telephone number of the calling party to any called party. However, merely utilizing the exchange system, the called party can only obtain the telephone number and might not be able to remind him/her who is actually calling. Some other exchange system can provide identification information including the telephone number and the name of the person registered for that number. Therefore, with this exchange system, the called party can obtain the calling number and the registered name for that number when the call is coming in. However, the calling party is not necessarily the person registered for that number. The calling party may be merely a family member or a company staff of the registered person. Therefore, it is requisite to provide a calling party identifying apparatus capable of receiving the identification information and informing the called party the exact caller's name, the telephone number of the caller, and the preference degree of the caller, thus the called party can respond to receive or not receive the phone call. Moreover, the calling party identification apparatus can disable the ringing of the phone call if the calling party has the call out of the preferred hours for him to call.

It is an object of the present invention to

provide a calling party identifying apparatus comprising a microprocessor, an LCD display, a first preference indicating means, a second preference indicating means, a key pad, a memory, a ringing detector, a code receiver, and a dual tone multifrequency (DTMF) generator. The memory is programmably stored with personal information of different potential calling parties. Each personal information includes a specific person name, the telephone number thereof, the preference degree of the person, and the preferred hours for the person to call. The calling party identifying apparatus can acquire the identification information of the calling party such as the telephone number, from the telephone lines and display the caller's name, the telephone number of the caller, and the preference degree of the caller, thereby helping the called party to determine whether to receive the call or not.

It is another object of the present invention to provide a calling party identifying apparatus which can respond to any call and cut off the ringing automatically if the call is made out of the preferred hours for the caller to call.

It is another object of the present invention to provide a calling party identifying apparatus which allows the user to make a phone call by dialing one or more characters representing a name of a person or a company instead of dialing the whole telephone number.

It is another object of the present invention to provide a calling party identifying apparatus which can
5 record all the incoming telephone number and the related calling times when the user is out and allow the user to review all the telephone information including the calling time, the caller's name, the telephone number, and the preference degree of the caller.

10 It is still another object of the present invention to provide a calling party identifying apparatus which is operable to call a pager right after an important call comes in but is not answered by any person, so the intended recipient would not miss any important call.

15 These and additional objects, if not set forth specifically herein, will be readily apparent to those skilled in the art from the detailed description provided hereunder, with appropriate reference to the accompanying drawings.

20 In the drawings:

Fig. 1 is a block diagram in accordance with the present invention; and

Figs 2A to 2C together constitute a circuit diagram of the present invention.

25 Now referring to the drawings and initially to Fig. 1, a calling party identifying apparatus in accordance with the present invention is connected in parallel with a pair of external telephone lines 11 and a telephone set 12 (or any other telecommunication

30

device such as a fax machine, an E mail or the like) for picking up the identification information of a calling party transmitted by the telephone lines 11. The additional presence of the identifying apparatus does not affect the standard function of the telephone set 12. The identifying apparatus comprises a microprocessor 24, an LCD display 25, a first preference indicating means 26, a second preference indicating means 27, a key pad 28, a memory 29, a ringing detector 22, a code receiver 21, and a dual tone multifrequency generator 23. The memory is a programmable memory such as an EEPROM. The code receiver 21 and the ringing detector 22 have their input terminals respectively connected to the external telephone lines 11 in parallel for detecting the transmitted signal from the lines 11 and further forward the detected signal to the microprocessor 24. The dual tone multifrequency generator 23 is actuated by the microprocessor 24, generating dual tone dialing signal and feeding the dialing signal to the external lines 11 for the owner to dial.

The code receiver 21 is electrically connected between the external lines 11 and the microprocessor 24 for receiving the calling party information, converting the information to digital signal and feeding the digital signal to the microprocessor 24. The LCD 25 is electrically connected to the microprocessor 24 for illustrating the related

information such as the telephone number and the name of the calling party or even more as will be described in greater detail. The memory 29 is allowed to be programmably stored with different personal information each of which including a personal name, the preference degree of the person, the preferred hours for the person to call, and the telephone number of the person. The microprocessor 24 responds to the telephone number of the calling party and searches the memory 29 to obtain the related personal information about the calling party. The first indicating means 26 includes a plurality of lights each of which has a color for representing a specific one of the preference degrees. The second preference indicating means 27 including a transistor and a speaker for generating different sound patterns to respectively represent different preference degrees for different calling parties.

The memory 29 has a database installed therein including a plurality of potential callers' information each of which includes a specific caller's name, the calling number of the caller, the preference degree thereof, and the preferred hours for the caller to call. The identification information of different calling parties is automatically acquired from the external lines 11 and stored in the memory 29. Basically the identification information is the telephone number of the calling party. For some exchange systems, the identification information

includes the telephone number and the registered person's name thereof. The preference degree and the preferred hours are set by the user. The telephone numbers of the potential calling parties together with the related names, the preference degree and the preferred hours are inputted by the user from the key pad 28 and are used to compare with the identification information of any dynamic calling party, thus when a telephone number of a calling party is matched with any one of the telephone numbers in the memory 29, the microprocessor 24 will actuate the LCD 25 to display the related information of the calling party including the telephone number, the name, and the preference degree. Actually, the microprocessor 24 can also cut off the ringing of the telephone, if the present call is not received during the preferred hours for the caller to call. Since the detailed circuit for cutting off the ringing is well known, it is not described herein. However, if none of the telephone numbers of the potential calling parties matches with the telephone number of the calling party, the telephone number of the calling party is automatically recorded in the memory 29, thus the calling party is converted to be one of the potential calling parties. However, for those exchange system which can send out the identification information including the telephone number and the registered person's name, the registered name and the telephone number will be recorded in the

memory 29 and will be displayed on the LCD 25 if they are not originally stored in the memory 29. The user can add the relating name, the preference degree, and the preferred hours of the calling party into the memory 29 together with the telephone number thereof constituting a personal database for the calling party. It is noted that the called party can variably predetermine a priority to be given to any entirely new calling party to decide whether or not to receive such calls. The telephone numbers of the potential calling parties can also be used for automatic dialing by manually operating the key pad 28 with at least one representative character of a person's name which is already stored in the memory 29 with his corresponding telephone number, thus permitting the user to depress at least a character instead of dialing the whole telephone number. The character(s) is/are not limited to the initial of the caller's name but whatever which can easily remind the user.

When in operation, the external lines 11 transmit the identification information of the calling party, the code receiver 21 receives the telephone number contained in the identification information and forwards the telephone number to the microprocessor 24. The microprocessor 24 responds to the received telephone number and searches the memory 29 for the same number and actuates the LCD 25 to show the caller's name and the corresponding data base including

the telephone number and the preference degree of the
5 caller. In the meantime, the first preference indicating
means 26 and the second preference indicating means 27
respectively illustrate the preference degree with a
light pattern and a sound pattern. As mentioned
previously, if the caller does not call during preferred
10 hours for him to call, the ringing is automatically cut
off.

Referring to Figs 2A to 2C, the detailed circuit of
the present invention comprises a first connector 11' for
connecting with the external telephone lines 11, a second
15 connector 12' for connecting with the telephone set 12.
The ringing detector 22 is composed of a photo-coupler.
The code receiver 21 and the dual tone multifrequency
generator 23 are arranged at the middle portion of the
figure. The key pad 28 comprising a plurality of key
20 switches is arranged at the top left side of the figure.
The microprocessor 24, the first preference indicating
means 26, the second preference indicating means 27, the
LCD 25, and the memory 29 are arranged at the rights side
of the figure. The first preference indicating means 26
25 includes at least two LEDs, one is green light for
illustrating the call is important and another is red
light for illustrating the call is not important. Of
course, the number of LEDs is not limited to two and the
light pattern for important levels is not limited to the
30 one mentioned. A power supply of the whole circuit is
arranged at the bottom

left side of the figure. Since the power supply is well known, it is not described in detail herein. The calling party identifying apparatus is allowed to be installed inside or outside of a telephone set.

The calling party identification apparatus as mentioned above is also allowed to be installed with any telecommunication device such as a fax machine, a computer or the like which is linked to a telephone line for screening the incoming information therefrom and automatically preventing any unwelcome or strange information to come in. Normally, when there is no call coming in, the identification apparatus will function like a clock with the LCD 25 thereof will show the time thereon. It is noted that a timer (not shown) is included in the identifying apparatus for time counting. It is noted that the identifying apparatus can also record all the incoming telephone number and the related calling time when the user is out and allow the user to review all the telephone information including the calling time, the caller's name, the telephone number, and the preference degree of the caller. The light pattern of the identifying apparatus remains until another phone call comes in and changes the previous pattern for the previous call. For example, if the green light indicates an important call and the red light indicates an unimportant call, the green and red lights both remain ON if important call and unimportant call come in during a time period when the

user is out. When the user comes in and sees the green light and the red light both ON, he will notice that at least one important call came in when he was out. Therefore, he will review the recorded information and find out the important call. If only the red light remains ON, then the user can ignore the recorded information, thus saving his time. Since the recorded information and the review of the information are fulfilled by software which is very user-dependent and well known thus it is not described in detail herein. The identifying apparatus is also allowed to be loaded with an extra software subroutine in the microprocessor 24 for responding to a not-answered important call (i.e., a call having high preference degree not being answered by the user or any other persons) by automatically calling a pager carried by the user. The pager will respond to the call from the identifying apparatus and illustrate the caller's information including the name, the telephone number on the pager. Since the extra software subroutine is well known, it is not described herein.

While the present invention has been explained in relation to its preferred embodiment, it is to be understood that various modifications thereof will be apparent to those skilled in the art upon reading this specification. Therefore, it is to be understood that the invention disclosed herein is intended to cover all such modifications as fall within the scope of the

appended claims.

CLAIMS:

1. A calling party identifying apparatus comprising

a ringing detector (22) electrically connected to a pair of external telephone lines (11) for detecting a call from a calling party;

a code receiver (21) electrically connected to said pair of external telephone lines (11) for detecting identification information from said calling party via said external telephone lines (11);

a microprocessor (24) electrically connected to said ringing detector (22) and said code receiver (21) for responding to the detection of the calling and receiving the identification information of the calling party temporarily;

a memory (29) being electrically connected to said microprocessor (23) and being programmably stored with different personal information each of which includes a personal name, the preference degree of the person, the preferred hours for the person to call, and the telephone number of the person;

a key pad (28) including a plurality of key switches being electrically connected to said microprocessor (24) for inputting the personal information of a potential calling party; and

an LCD (25) electrically connected to said microprocessor (24) for displaying the related personal information of the calling party after the

microprocessor (24) receives the identification information of a calling party;

whereby said microprocessor (24) responds to the reception of said identification information of said calling party and searches for an equivalent telephone number from said memory (29) and displays the located personal information including the personal name, the preference degree of the person, and the telephone number of the person on said LCD (25) when the telephone number of the calling party is present in said memory (29), otherwise it merely displays the telephone number on said LCD (25).

2. A calling party identifying apparatus as claimed in claim 1 further comprises a first preference indicating means (26) including a plurality of lights each of which is used to represent one of the preference degrees.

3. A calling party identifying apparatus as claimed in claim 1 further comprises a second preference indicating means (27) including a transistor and a speaker for responding to the preference degree and emitting a corresponding sound pattern to illustrate the preference degree of the call.

4. A calling party identifying apparatus as claimed in claim 1 further comprises a dual tone multifrequency generator (23) electrically connected between the external lines (11) and the microprocessor (24) for sending out multifrequency signals

representing a corresponding character for a corresponding telephone number already stored in said memory (29), therefore a user can dial out by said character instead of said number.

5. A calling party identifying apparatus as claimed in claim 1, wherein said ringing detector (22) is a photo-coupler.

6. A calling party identifying apparatus as claimed in claim 1, wherein said memory (29) is a programmable memory.

7. A calling party identifying apparatus as claimed in claim 1, wherein said microprocessor (24) is allowed to cut off the ringing of a phone call, if said call is received out of the preferred hours.

8. A calling party identifying apparatus as claimed in claim 1, wherein said microprocessor (24) is operable to call a pager right after a high preference degree call is not answered by any person so the intended recipient would not miss any high preference degree call.

9. A calling party identifying apparatus substantially as hereinbefore described with reference to and as shown in the accompanying drawings.

Patents Act 1977
Examiner's report to the Comptroller under
Section 17 (The Search Report)

16

Application number

GB 9312313.1

Relevant Technical fields

(i) UK Cl (Edition L) H4K: KFB;KFD;KFH;KLL

(ii) Int Cl (Edition 5) HO4M

Databases (see over)

(i) UK Patent Office

(ii) ONLINE : WPI

Search Examiner

AL STRAYTON

Date of Search

4 AUGUST 1993

Documents considered relevant following a search in respect of claims ALL

| Category (see over) | Identity of document and relevant passages | Relevant to claim(s) |
|------------------------|--|-------------------------|
| X | GB 2251764 A page 2, lines 20-26 | 1 |
| X | EP 0408041 A2 column 7, lines 6-28 | 1 |
| X | US 4924496 column 2, lines 44-54 | 1 |
| X | US 4894861 column 4, lines 10-54 | 1,3 |

| Category | Identity of document and relevant passages 17 | Relevant to class (s) |
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| | | |

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